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AU-SAFGRAD

Challenges and Opportunities for Strategic Agricultural Commodity Value Chains Development in the IGAD Region

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List of Acronyms and Abbreviations

AfDB	African Development Bank
AFSS	Abuja Food Security Summit
ASAL	Arid and Semi-Arid Lowlands
ASARECA	Association for Strengthening Agricultural Research in East and Central Africa
AU-SAFGRAD	African Union Semi-Arid Food Grain Research and Development
CAADP	Comprehensive Africa Agricultural Development Program
CBT	Cross Border Trade
COMESA	Common Market for East and Southern Africa
CSA	Central Statistical Agency
DB	Deutsche Bank
ECA	East and Central Africa
ECX	Ethiopian Commodity Exchange
FAO	Food and Agricultural Organization of the United Nations
FAOSTAT	Online statistical database of the FAO
FSNAU	Food Security and Nutrition Analysis Unit
HDI	Human development indicators
ICPAC	IGAD Climate Prediction and Application Centre
IDDRSI	IGAD Drought Disaster Response Initiative
IFPRI	International Food Policy Research Institute
IGAD	Inter-Governmental Authority on Development
IPGRI	International Plant Genetic Resources Research Institute
KARI	Kenyan Agricultural Research Institute
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries, Uganda

MIP	Minimum Integration Program of IGAD
MOA	Ministry of Agriculture
MOAI	Ministry of Agriculture and Irrigation, Sudan
MT	Metric tones
MTIC	Ministry of Trade, Industry and Cooperatives, Uganda
NAADs	National Agricultural Advisory Services
NARO	National Agricultural Research Organization, Uganda
NARs	National Agricultural Research systems
REC	Regional Economic Community
SADC	Southern Africa Development Community
UNDP	United Nations Development Program
WFP	World Food Programme
ZAADS	Zonal Agricultural Advisory Service

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Foreword

Semi-Arid Food Grain Research and Development (SAFGRAD) office is one of the specialized technical offices of the African Union Commission under the Department of Rural Economy and Agriculture (DREA). The mandate of AU-SAFGRAD is to lead, coordinate and facilitate the formulation of appropriate policies and programs that build resilience of rural livelihoods in semi-arid Africa. This is achieved through strengthening institutional capacities aimed at advancing agricultural research, technology transfer and adoption; enhancement of value chains; management of natural resources; and mitigation and adaptation to climate change and combating desertification. AU-SAFGRAD vision falls within the Comprehensive Africa Agricultural Development Programme (CAADP) framework which is at the heart of efforts by African governments to accelerate growth and eliminate poverty across the continent.

Commodity Value chain analysis helps to identify actors and activities and to inform decision for building resilience of smallholders whose livelihood and welfare are affected, directly and indirectly, by the actions of the different stakeholders. The analysis helps to situate the market system- through which household access inputs and staples as well as sell their surplus agricultural commodities – in terms of its competitiveness, efficiency and reliability. To achieve this, it is essential to clearly understand the causes of commodities high transaction costs through strategic commodities value chain assessment. It is within this context that AU-SAFGRAD facilitated this study to assess the opportunities and challenges for strategic agricultural commodities value chains development in the IGAD region of Africa.

The IGAD region is the most food insecure part of Africa with significant part of its population permanently dependent on food aid and imports. There is no gainsaying the fact that, the unsustainable cultural practices adopted, high transaction costs and the fragmented and dispersed nature of farm holdings have, markedly, limited the un-competitiveness of the agricultural sector. The fact that only a fraction of the fertile land is presently under cultivation presents huge potential to

leverage on agricultural transformation as the engine of growth in the region. Adopting a sustainable production and efficient post-harvest activities in the sector will generate sustainable output to bridge the demand –supply gap of strategic commodities and make the region food self-reliant. Indeed this is the goal of the countries of the IGAD region- to tackle the food security challenges occasioned by drought. In order to achieve this landmark objective, the agricultural sector, in the member states, needs to be properly repositioned.

In this study, an assessment has been done to analyze the prospects for agricultural value chain development with few selected crop commodities as case studies. Commodity value chain approach was adopted so as to identify the structural and dynamic factors that affect the contributions of each actor to the chain. Five countries were covered in the study, relying mainly on administrative data, to capture variability within the region. It is our sincere hope that the findings of this study will provide useful guides to inform the development of workable regional and national blueprints to improve the livelihood and welfare of farmers and other actors who, directly or indirectly, draw sustenance from the agriculture sector.

Dr. Ahmed Elmekass

Coordinator, AU-SAFGRAD

Executive summary

The Intergovernmental Authority on Development (IGAD) region is comprised of eight member states (Djibouti, Eritrea, Ethiopia, Sudan, South Sudan, Somalia, Kenya and Uganda). As a Regional Economic Community (REC), it is one of the eight building blocks of the African Economic Community. Most of the region is classified as arid and semi-arid and characterized by dry climate with minimal and unreliable precipitation. Also, the region is furnished with a vast array of unexploited, fertile land and water bodies. These resources if optimally harnessed can be used to fast track agricultural led growth for improved livelihoods and shared prosperity in the region. Unfortunately, poorly developed agricultural commodity value chains coupled with a host of infrastructural and policy related constraints and conflicts are hampering progress in cross border trade and investments in agriculture in this region. It is against this backdrop that this study was initiated to identify actors and activities that limit the chain efficiencies of strategic agricultural commodities. Five countries – Djibouti, Ethiopia, Sudan, Uganda and Kenya were covered in the study. Sesame and sorghum were selected as case studies because of their importance as key commercial and households' food security crops respectively.

Various agricultural commodities are produced in the region; these commodities have varying economic importance. Livestock production occupies a pride of place in the economy of the region. Among the economic crops produced in the region, this present study has selected Sorghum and Sesame for detailed analyses of their strategic challenges.

Sorghum is a staple cereal in Eritrea, Ethiopia and Sudan. It is typically grown by small-scale, resource-poor farmers in dispersed holdings and a significant proportion of what is produced is consumed as home consumption. The sorghum sector is low input and low output system, presenting challenges for rapid development. The sorghum value chain includes several key agents; seed multipliers and suppliers, producers, middlemen and small traders, wholesalers, grain millers, retailers and

exporters. These agents are supported by facilitators such as National Agricultural Research System (NARs) and agricultural extension system.

Sesame is produced predominantly by small scale farmers in the region. The system of production employed is simple and have not changed over many generations. Three member countries of the IGAD region – Sudan, Ethiopia and Uganda are listed among the major producing countries of the world. The production and marketing system of sesame has remained largely underdeveloped and inefficient. Sesame production and marketing activities are characterized by small holder, resource-poor farmers, assemblers, processors and retailers. Other actors in the Sesame value chain are the seed developers and merchants, extension and regulatory services providers.

In general, the value chain for strategic agricultural commodities is poorly developed in the region. At the country level, the inefficiencies in the commodities value chain were mainly due to lack of standardization, poor quality of harvest, lack of market support services, and bad roads infrastructure .These resulted in high transaction costs in the downstream commodity sector. At the cross-border trade level, high inefficiency was occasioned by mainly non-tariff barriers caused by excessive documentation and processing delays, excesses of border agents and high transport costs.

The study concludes that increased sorghum and sesame chain efficiency can be achieved in the region. The massive pool of farm families involved in production and marketing as well as the market demand in the region present huge opportunities to fast track improved livelihoods, economic growth and partnership in the region through sorghum and sesame value chains development. The creation of an enabling production and marketing environment at the national level, to leverage on public private partnership models, while also presenting opportunities for increased value addition, services by primary actors are needed to catalyze the benefits. However, to achieve this landmark, some key challenges have to be overcome. There is the need to address information gaps at all levels in the value chain, encourage public private partnership through incentivized schemes and infrastructural development. Also, there is the need to promote collaboration and cooperation in the region through trade in the agricultural commodities. The study recommends the inauguration of a high level technical advisory group to be facilitated by IGAD secretariat.

The group will be responsible for charting the road map for institutionalization and implementation of integrated commodities value chains considered key for ensuring food security and enhancing regional trade.

Chapter I

Introduction

1. Background

The region covered by the Intergovernmental Authority on Development (IGAD) comprises eight member states (Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda) and it is a Regional Economic Community (REC) - one of the eight building blocks of the African Economic Community (Fig. 1). It occupies a land area of about 5.2 million square kilometers with a population of 215.6 million (World Bank, 2012). The IGAD region is unique in its geographic and socio-economic s etting: the location and size is strategic, it is ecological diversed with vast natural and human resources. Ethnologically, the cultures of the people in the zone are related and with seemingly related livelihood pattern.

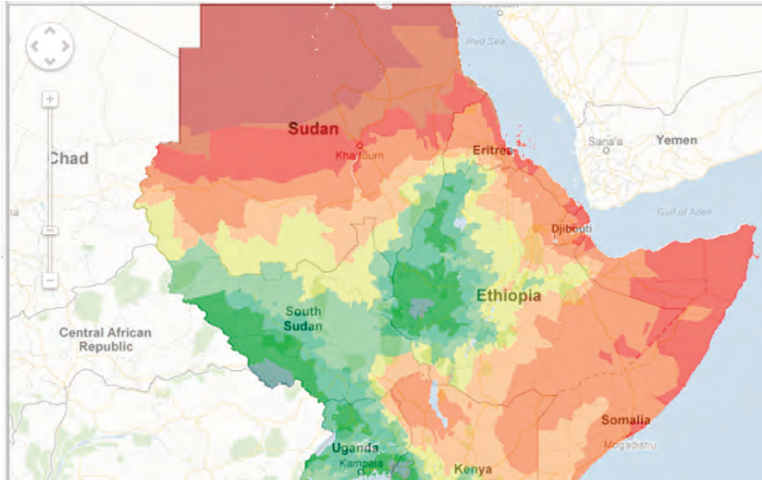

Fig. 1. Map of IGAD Member States
Source: (IGAD, 2012)

The average population growth rate is estimated as 3.0% per annum, the population structure shows that about 50 of the population are below 15 years of age; revealing the high dependence nature of the population (FAO/IGAD, 2013). Similarly, there is high incidence of poverty in the area as 50% of the population in the IGAD region lives on less than one US dollar per day. The region's population of over 200 million is an indication of the high food demand and existence of viable markets in the area which are capable of stimulating production, trade and sustained economic partnership among member states. Table 1 shows key human development indicators; the Human Development Index, showing the low human development profile in the region.

TABLE 1. Human Development Indicators

Country	HDI	Life expectancy at birth(years)	Mean years of schooling	Expected years of school
Djibouti	0.430	57.9	3.8	5.1
Eritrea	0.351	62.0	3.4	4.6
Ethiopia	0.363	59.3	1.5	8.5
Kenya	0.509	57.1	7.0	11
Somalia	0.285	50.7	4.8	1.8
South Sudan	-	54.0	-	-
Sudan	0.408	61.5	3.1	4.4
Uganda	0.446	54.1	4.7	10.8

Source: Human Development Report 2011Note: - (Data not available)

The IGAD region is prone to recurrent severe droughts which hamper crop and livestock production; about seventy-six percent of the entire region is classified as arid and semi-arid lands (AfDB, 2010). Almost half of the region's geographical area receives annual rainfall of less than 350mm, while another 25 percent (classified as semi-arid) receives between 350 and 700 mm (IGAD 2005). The limited and irregular precipitation coupled with high level of political and social insecurities, widespread resource-use conflicts and other natural and man-made disasters have given rise to the perennial food deficit situation in the region. The concomitant effect of these is high dependence on food aid and import. This makes the IGAD region one of the most food insecure regions in the world. However, studies conducted in the region indicate that open cross-border trade and efficient production and marketing conditions can help to reverse the situation.

The lowlands of Djibouti, Ethiopia, Kenya, and Somalia are geographically, linguistically, and economically distinct from the highland areas of these countries. While the highland economies are largely dominated by settled crop production and non-farm industries, the lowlands are dominated by urban dwellers (10–20% of the total ASALs population) (Headey and Kennedy, 2011). Pastoralism (nomadic livestock rearing), and secondary livelihoods, such as collection of natural products for consumption and sale (including firewood, charcoal, and gum-resin) are common livelihoods pattern in the area. The dominance of pastoralism is a direct result of seasonal and annual variation in rainfall duration and

distribution which affect the availability and quality of grazing resources.

Enhancing production and exports of agricultural products is essential for the economic growth of the IGAD region and the African continent at large (See economic indicators on Table 2). FAO/IGAD (2013) reported the dismal performance of Africa's agricultural exports, which amounted to some USD21 Billion in 2002-05, with a growth rate of 2.3% per annum since 1996. The continent's global share of agricultural exports has dropped steadily from 8 percent in the 1970s to 1.3 percent in 2005. FAO (2008) reported that Africa's failure to produce enough to meet its food requirements has contributed to the progressive growth in its food import bill, reaching a peak of USD23 Billion in 2007, which is significantly higher than the value of its agricultural exports. Agricultural imports accounted for about 23 percent of total African merchandise imports. Reversing this situation will, therefore, require increased efforts by African countries and the IGAD member states in particular. The IGAD member states should also take measures to enhance their regional co-operation in all priority areas so as to exploit the vast resources and propel the region to new economic heights.

In recent years, enhancing intra-REC and inter-REC trade has gained considerable momentum due to the identified welfare and inclusive growth opportunities it furnishes for member states. The adoption of CAADP in 2003 with market access and trade as one of its four pillars and the declaration of the Abuja Food Security Summit in 2006

TABLE 2. Population size and economic indicators

Country	Size in Square Km	Population Size (million)	GDP at current millions USD	Real GDP growth rate %	GDP per capita (current USD)	Inflation % 2009
Djibouti	23,200	0.9	983	5.5	1137	1.7
Eritrea	117,600	5.2	1,873	3.6	369	34.7
Ethiopia	1,104,300	85.2	28,476	8.8	344	3.8
Kenya	592,909	39.4	29,394	2.5	739	19.6
Somalia	637,660	9.4	2,012	2.6	220	-
S. Sudan	644,329	8.26	19,172	1.9	--	
Sudan	2,505,813	40.3	65,794	6.1	156	11.2
Uganda	241,038	31.9	16,828	5.3	514	13.0
IGAD	5,222,220	212.3	145,360	4.91	--	

Source: Africa Statistical Yearbook 2011 Note: - (Data not available)

are pointers to wide acceptance of the benefits. The Abuja 2006 Summit specifically declared that in order to achieve significant economies of scope and scale in African agriculture, emphasis should be placed on promoting regional/sub-regional trade, based around a limited number of strategic commodities, without prejudice to ongoing efforts at sector-wide developments (AU, 2006). The Summit specifically resolved to increase intra-African trade by promoting and protecting strategic agricultural commodities at continental and sub-regional

level. Thus for selected strategic commodities, a common intra-regional common market would offer an appropriate economic space to foster private investments. In this context, the IGAD region should aim at expanding the horizon of the trade of such commodities, a domain where the region has a comparative advantage to produce for export within and beyond its regional borders.

USAID (2009) reported that the concept of commodity value chain encompasses the issues of organization and coordination; the strategies and the power relationship (including gender concerns) of the different actors in the chain. The process is buoyed by the need to reduce the transaction cost associated with movement of materials and products necessary to deliver a final product with high competitive advantage. Key elements in the value chain that help situate the analysis to food security situation include the spatial attributes and relevance or worth of the value added by the various activities as well as the power relation or influence of each actor. Through value chain analysis, we are able to acquire a comprehensive understanding of complex systems with multiple interdependent and interrelated links. This is because each link in the chain is analyzed in terms of the value added and the costs incurred. From the policy point of view, the analysis provides the opportunity for mapping activity bottlenecks, identifying bottlenecks deserving priority attention and who to address them (DFID 2008).

The assessment of commodities value-chain weaknesses and strengths will contribute to understanding of the potentials of the sector to fast track inclusive growth and promote welfare of actors along the chain. It is also impor-

tant for repositioning the sector by enhancing the competitive advantages through a reduction in the associated transaction costs along the chain. While previous studies have attempted to present a comprehensive commodity value chain assessment, most of the studies have concentrated efforts particularly on the livestock sub-sector and the studies are limited only to country studies.

There is the need for a good understanding of the complex socio-economic and agricultural setting of this unique region in reference to efficiency, competitiveness and reliability of agricultural production and marketing systems. This understanding will provide the necessary policy prop to develop and implement workable integrated value chains to improve the capacity of small holders to participate in market driven agricultural development. When this happens, a situation will be created where surplus produce will be available to trade within and amongst member countries and help them alleviate incessant food security challenges and substantially reduce the whopping cost of food imports from overseas. It is against this background that AU-SAFGRAD commissioned a value chain analysis study in the IGAD region.

2. Objectives of the study

The general objective of the study was to analyze the challenges and opportunities for the promotion of strategic agricultural commodity value chain development in the Region.

Specifically, the objectives were to:

- identify key promising agricultural value chains and related constraints and opportunities

- map the major agricultural value chains, linkages between processes and actors
- identify the region's suitability, existing enabling environment and comparative advantage in the production and marketing of agricultural produce

3 Context and Scope of study

Although most of the IGAD region is characterized as arid and semi-arid and said to be less suitable for agricultural production, a significant proportion of the region has substantial potential to support arable crops and livestock production on a commercial basis. A number of the countries in the region including Sudan, Kenya, Ethiopia and Uganda are notable producers of cereals and other food commodities. The region's natural endowments of water bodies – perennial rivers, lakes and ground water reserve - is indicative of the irrigation potentials in supporting all year round agricultural production. However, a conducive and comprehensive agricultural policy environment; in terms of strategies and implementation frameworks, is needed to increase agricultural production and enhance smallholders' livelihoods not only by ensuring household food security but also by linking farmers to sustainable and high value markets which have, hitherto, remained elusive in the region.

4 Methodology and approach

1.4.1 Area of study

The study was conducted in five countries in the region namely, Djibouti, Ethiopia, Sudan, Kenya and Uganda.

The selected countries are representative of the IGAD region considering the peculiar ecological and economic attributes. Two important agricultural commodities (Sorghum and Sesame) were selected for the study. The criteria used in selecting the commodities were their relative importance as food and cash crops to farm households cutting across the countries. Also, the production spread of the commodities in the region as well as market (local and export) potentials was used as basis for selection.

1.4.2 Method of Data Collection

During the study, officials and experts of the ministries of agriculture, trade and investment agencies, the private sector, research and other national R & D institutions as well as regional and international organizations and agencies involved in agricultural development were consulted. Primary data were collected through personal interviews of the officers and personnel in the organizations and agencies. Information were also, sourced from extant literature and publications of development agencies through in-depth desk review. The desk review examined relevant literature such as statistical bulletins, strategy and policy documents, and published reports on selected value chains by different research and development institutions. Personal interview sessions were held to obtain professional opinions of experts in the field on key issues using prior prepared checklist with discussion points (See annex 1). Through informal interview, various resource persons working in national and international organizations provided crucial information on the key issues per-

taining to specific chain actors' challenges and strength. Particularly, informal consultations with the key stakeholders in the private and public sectors including regulators, dealers and traders helped to beam the lights on the complex interactions in the value chain and existing challenges and opportunities (Annex 2). Direct actors in the value chain were interviewed about their operations as well as technical and policy related constraints encountered. Indirect actors (facilitators) in the value chains including government officials were also interviewed about existing support services to the selected actors at each node of the chain.

5. Organization of the report

The report is presented in five main Chapters. Chapter one gives an overview of the background, study objectives, methodology and approaches used as well as the structure of the report. Chapter two gives a general background on agriculture in the IGAD region. It describes the major agricultural commodities and their relative importance in the agricultural economy of IGAD region. An in-depth value chain analysis of the two selected crops is described in Chapter three. The section elaborates the production, marketing and value chain linkages of the sesame and sorghum sectors. In this section the major opportunities and constraints related to value chain development are highlighted. Chapter Four describes the existing enabling environment (policies, infrastructure, geo-political advantages of the region) for trade in agricultural commodities. Chapter Five describes summary and conclusions, policy implications and recommendations.

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Chapter Two

Overview of Agriculture in the IGAD region

1. The Agricultural Economy of IGAD member States

The economy of most IGAD member countries including Uganda, Ethiopia, Kenya, Sudan, South Sudan and Eritrea are agriculture-based, though there are variations in terms of the sector's contribution to GDP of the countries. In Ethiopia, for example, agriculture remains the main contributor to the GDP, contributing 47 percent to the national GDP (Grow Africa, 2013). In Uganda and Kenya, however, the rapid development of the service sector with a growth rate of about 9.5% has outpaced agriculture, contributing 45 percent to the GDP, above agriculture's contribution of 30 percent (AfDB, 2014). Nevertheless, agriculture still accounts for about 75 percent of the labor force employment in all the countries which underscores the importance of the sector in job creation, livelihood sustainability and poverty reduction. Although, agriculture seems to be losing ground in few countries, it is still the most important sector and its overall performance over the recent past as measured by agricultural GDP has been recognized (Table 3). The growth rate was highest in Sudan and Ethiopia with mean growth rates of 5.3% and 5.8% respectively (FAO/IGAD, 2013).

TABLE 3. Agricultural GDP growth (1993 – 2010) in some IGAD countries

Country	Total Food	Cereals	Livestock	Total
Djibouti	-	-	4.4	3.9
Eritrea	-	-	-	3.6
Ethiopia	5.0	5.8	3.9	5.3
Kenya	3.4	1.3	4.3	3.7
Somalia	1.4	-0.4	1.3	1.6
Sudan	5.9	2.0	7.5	5.8
Uganda	2.7	3.1	4.2	2.7

Source: FAO/IGAD, 2013; - Data not available

The region is highly dependent on rain fed agriculture and over 75 percent of the total agricultural output is produced by smallholder farmers with farm sizes of less than 2.5ha, producing mainly for home-consumption, and using traditional technologies. Irrigated agriculture accounts for less than 2 percent of total agricultural production. The extent of irrigated agriculture remains insignificant in the region, despite the recurrent droughts and associated chronic food insecurity. Fig. 2 shows the major land uses in the region. The existing water resource potential for irrigation, in terms of lakes, rivers and water harvesting, remains untapped. The region is sitting on a long marine shoreline of over 4,000 km, which remains largely unexploited for fisheries and mining, while the second largest fresh water lake in the world (Lake Victoria) and indeed the longest river in the

world (the Nile) are also found in the region. Besides, there are several ephemeral streams and underground basins that can be successfully used for small scale irrigation programs (AfDB 2010; IGAD and UNEP 2007).

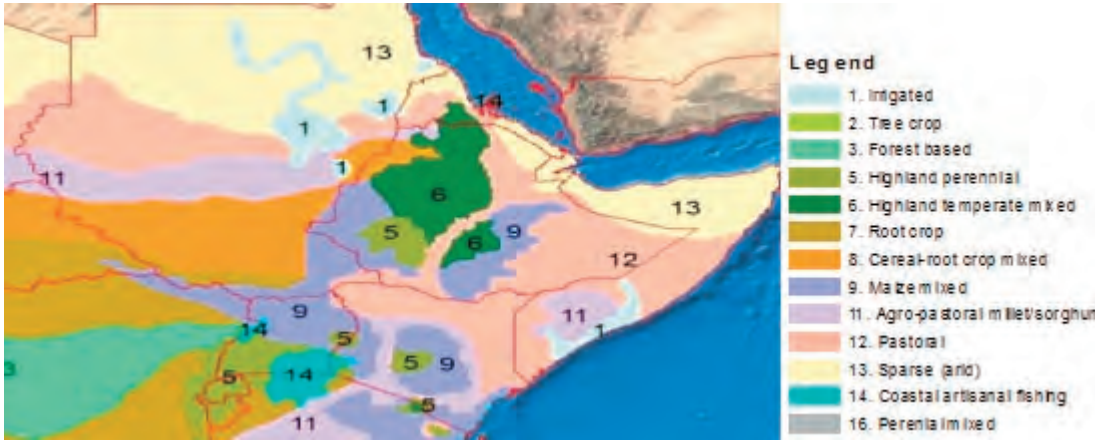

Figure 2: Land use pattern in the IGAD region

Source: (*FAO and ICRAF 2012)*

Although often categorized as drought prone, and faced with complex structural challenges, the IGAD region possesses some of the most productive agricultural land in Africa (IGAD and UNEP 2007). The well-watered highlands have fertile soil with abundant rainfall and relatively lower prevalence of human and animal diseases and provide some of the most favorable agricultural conditions in Africa, even though the potential is yet to be exploited. The proportion of arable land utilization ranges from 48 percent in Uganda to only 15 percent in Sudan. The proportion in Somalia, Kenya and Ethiopia is

42 percent, 25.6 percent and 28.5 percent respectively. Djibouti utilizes only a small proportion of its arable land.

The lowland areas of the region, which are mainly arid- and semi-arid cover some of Africa's most important livestock production zones inhabited by pastoralists. The production systems are similar especially in adjacent countries, and pastoralists move freely with their herds across national boundaries of Djibouti, Ethiopia, Somalia, Kenya, Uganda and the Sudan. This happens, mainly, along the feed/water (grazing routes) and transport routes with the primary destination being the sub-regional export marketing points. Also, transhumance results in seasonal migration of pastoralist in search of pasture and water resources for the herds. As the pastoralist mode of production depends largely on mobility in search of pasture and drinking water, most pastoralists move between grazing areas taking strategic advantages of seasonal and geographical variability in the supply of forage and water resources.

To understand the structure (potentials and constraints) of the agricultural economy of countries in the IGAD region, country specific agricultural production and marketing conditions are summarized below:

2.1.1 Djibouti

Djibouti is mostly arid, and crop production is not a very dominant sector compared to other sectors such as the service sector. Agricultural production is markedly hampered by the low rainfall. Scarcity of water is a

problem and efforts are underway to promote water harvesting to boost agricultural production. Eighty percent of consumed food products come from Ethiopia. Yemen, Egypt and Kenya are among the other suppliers (Ministry of Agriculture, Djibouti). There is substantial livestock wealth and pastoralism is a fairly well developed production system in the country. Livestock that are trekked in through the many cattle routes, informally, from Ethiopia and Somalia constitute a significant source of income for the country. There is a regional export center (quarantine services) which was established to handle trade of cattle, camels, sheep/goats and to make sure that the traded stocks meet recommended standards. Though there are no records of volume of stock traded, the MOA, Djibouti, estimates that over a million animals are sold yearly in the country. Livestock products are processed for export by private firms who operate specialized slaughter houses. The country also produces vegetables under irrigation system from about 1000ha of land. Plans are underway to increase the area covered by another 10000 ha. However, water shortage and soil salinity problems are presenting serious challenges to this initiative. Government production incentives include inputs support scheme, tax rebates and reduced taxes for livestock farmers. To satisfy demand for cereals, Djibouti is presently producing wheat on a 5000ha land in Ethiopia. The wheat is milled and processed into flour by private firms. The government then sells the flour to wholesalers and retailers or directly to the public. The value-chain of locally produced food, under this land arrangement, is characterized by a large number of marketing intermediaries, mostly rent takers, whose activities add little or no value to

the products. This result to high transaction costs which drive prices of local produce upwards making them un-competitive compared to imported food products from Europe and neighboring countries. The situation is further compounded by un-favourable custom barriers on both sides of the border which results in transaction delays and increased time costs. The importers are faced with a number of challenges including financial and high storage and transportation (transportation of products on open trucks on a bad road) costs. Most times the importers are asked to pay in advance without prior knowledge of produce quality and quantity for the consignments. The produce is shipped and delivered to rented stores which are poorly managed and thereby constituting further risk challenges from quality deterioration in addition to the high storage costs incurred. The national chamber of commerce estimated that the process results in between 30-40% losses in quality of produce. In general, the largest portion of the country's food needs is met from imports which are mainly private sector driven.

2.1.2 Eritrea

Agriculture is the backbone of Eritrean economy; it is the source of livelihood for the vast majority of the Eritrean people. About 70 percent of the economically active population depends on agriculture and agro-allied industries as source of livelihood (Rena, 2007). Crop production and livestock herding are core economic activities in the rural areas. There are three major production systems in Eritrea, and these are: crop agriculture, agro-pastoralism and pastoralism. Pastoralists are found in the western and

eastern lowlands while agro-pastoralists are found throughout the country. Crop production mainly comprise rain-fed mixed cropping. Major crops cultivated are sorghum, millet and sesame and cotton. Horticultural crops such as onions and tomatoes are cultivated using irrigation system (Mochoge and Zziwa, 2004). The lowland regions have large concentration of ruminant livestock. Although agriculture is the most important sector in terms of employment and food supply, its contribution to the country's GDP is relatively low; estimated to be between 21 to 30% (World Bank 1994). Agricultural productivity level in Eritrea is generally low for most crops commodities; the average cereal yield per hectare is among the lowest in Africa (Rena, 2002). The contribution of agriculture to total exports is also low with most of the exports coming from livestock products.

2.1.3 Ethiopia

Eighty-three percent of the population of Ethiopia depends directly on agriculture for their livelihoods, while many others depend on agriculture-related cottage industries such as textiles, tanning, and food processing. Agriculture contributes up to 50 percent of gross domestic product (GDP) and up to 90 percent of foreign exchange earnings. Ethiopia has ample natural, institutional and human resources for agriculture development (IFPRI, 2013); and about 111.5 million hectares of land. Although 74 million hectares are suitable for arable crop production, only 13 million hectares is presently cultivated. Water resources are also plentiful in most part of the country. There are about 12 million farm families

providing the needed human resource support for the highly labour intensive production systems practiced. Ethiopia's livestock resources are among the highest in the world – in fact, first in Africa, in terms of numbers. The country also has a high level of biodiversity, with different economically important crops indigenous to the country (such as Teff). In spite of these abundant resources, the low productivity and lack of supporting government policies to fast track growth in the sector present challenges for meeting the food needs of the over 85million people. High income inequalities and declining natural resources potential were also found to pose great challenges to poverty alleviation programmes and the attainment of household food security, (IFPRI, 2013).

2.1.4 Kenya

Kenya has implemented key strategies, including the national agri-business strategy, food and nutrition strategy and the livestock and seed policies strategy needed to guide growth and development in the agricultural sector. Most of the strategies are fairly comprehensive prescriptions formulated and implemented to mitigate associated constraints in the subsector. The National Dryland Management Agency (NDMA) was established to address the peculiar problems of agriculture and sustainable livelihoods in the dry arid zone of the country. The Vision 2030 and the drought emergency strategy particularly addressed development in the fragile environments. Similar to the other countries in the IGAD region, the agriculture is predominantly small scale and rain fed. Productivity is low because of sub-optimal use

of fertilizers and other inputs (FEWSNET, 2010). The post-harvest and agro-processing sector is not well developed, except in the dairy subsector. Private sector investment in agriculture is limited due to the under-developed infrastructure support in the country. The Kenyan Agricultural Research Institute (KARI) and partly the Universities are responsible for developing and supplying effective productivity enhancing technologies, however, the research system in general is poorly funded. It was observed that the research-extension linkage and technology dissemination effort have not been very efficient after the decentralization of the system. The situation is further complicated by the low extension agent-farmer ratio of 1:4000. The implication of this is that productivity enhancing technologies are not transmitted to the farmers particularly in the dry semi arid areas of the country. However, KARI has launched a new initiative to assist with the dissemination of technologies following the decline in extension interventions after the structural changes through aggressive on-farm demonstration strategies. The success and spread of this strategy is also limited by funds.

The rain-fed agricultural system is faced with many challenges related to climatic variability and other unsustainable cultural practices. Concerted efforts to enhance agricultural production and productivity have not been so successful, particularly, in the dry arid and semi-arid ecologies of Kenya. The roles of women and youths in the sector have been masked by the focus on households' head (mostly male dominated) as the target of most rural development initiatives. To fast track inclusive growth in

the sector, special support program to enhance the participation of women and youths have been put in place. The focus of the program is credit intermediation to farmers, especially women farmers, from a special fund dedicated for agro financing. The contribution of irrigation agriculture to total production has remained remarkably low over the years. The new initiative to develop one million hectares for irrigation agriculture devoted to rice production is commendable and it is envisaged that this project would serve as the flagship for agricultural transformation especially in the dry zones.

2.1.5 Somalia

Agriculture is an important economic activity in Somalia not only in terms of meeting the food needs of the population (about 50% of cereal requirements are met through domestic production) but, also as a source of viable livelihood. Agriculture is a major component particularly for two of the main rural livelihood systems in Somalia which are agro-pastoralist - mix of crop and livestock production based livelihood and crop production - agriculture based livelihood (FSNAU 2012). Only 1.6% of Somalia's total land area is cultivated while about 69% is under permanent pasture showing the importance of livestock herding to the agricultural economy of Somalia. Rain-fed dry-land farming is the dominant agricultural production; this is complemented by irrigation from the waters of the *Shabeelle* and *Jubba* rivers or from collected rainwater in localized settlements. Corn, sorghum, beans, rice, vegetables, cotton, and sesame are the common crops cultivated. The commercial crops, bananas and sugarcane,

are grown on irrigated land along the two rivers (FSNAU 2012).

2.1.6 South Sudan

In the world's newest nation, South Sudan, the agriculture sector occupies a pride of place in the economy as the largest employer of labour. It accounts for about 80% of total employment (Diao et al., 2012). South Sudan is naturally endowed to furnish a prosperous agricultural driven economy. The abundance of fertile soil, ample water supply (both surface and underground), and a conducive climatic condition to sustain all-year-round production show the high agricultural potential of the country. It is estimated that of the about 70% of fertile arable lands in the country, only 4% is currently under cultivation. The land is suitable for producing a wide range of crops, including annual and tree crops such as grains, vegetables, coffee, tea, and fruits, and orchard products (Diao et al., 2012). The value of total crop production is estimated at US$600 million per annum. Crops together with livestock and fishery products make up about US$800 million worth of total agricultural value annually, which is relatively low compared with that of its close neighbors. Agricultural productivity is low in South Sudan and there is a huge gap between the county's actual farm yield and the potentially achievable yields. The average cereal yield is only about 0.95 ton/ha compared 1.5ton/ha average for the region (FAO/WFP, 2011). Internal markets are to a large extent not developed due to poor roads and market infrastructure. Most rural households produce some cereals but rely on

livestock as a buffer against seasonal variability in food supply and income. At the national level, aggregate production of staple cereals lags behind consumption by about 30 per cent.

2.1.7 Sudan

Rain-fed agriculture is the dominant production system in Sudan representing about 91% of total production. The agricultural production system can be classified into three broad types – large irrigated, semi-mechanized and commercial and subsistence farms. The average land holding cultivated ranges from 2.5ha per household in the traditional system to 50ha in the semi-mechanized and over 500ha under the large irrigated schemes. Ministry of Agriculture data shows that in terms of coverage; small scale farmers constitutes 57.8%, semi-mechanized 37% and the large scale irrigated estates such in *Gezira* covers about 5.2%. In terms of their contributions to agricultural output, the traditional rain-fed accounts for 42%, semi-mechanized 27% and the irrigated sector 31%. It is observed that about 90% of total crop output from the traditional system comes from the western part of the country; where most farm operations (particularly in vegetable production) are performed by women. Similarly, 80% of agro-processing is performed by women in the western part of the country. Although, women are major players in agricultural operations their role in marketing is limited, despite the governments' recent efforts to increase their participation by supporting the establishment of women's marketing cooperatives and providing credit access to improve their financial capacity. The financial

policy of the government mandates microfinance institutions to set aside 12% of borrowings for funding women in agricultural production. However, due to insufficient information and lack of local mobilization support, the impact of this has been greatly limited, and only about 3% of this is presently realized.

2.1.8 Uganda

Agricultural production is about 98% subsistence oriented while commercial farms constitute the remaining 2%. The land holding is small and fragmented and not more than 1ha per household. Uganda has implemented the commodity approach for agricultural development; through the identification and promotion of important crop enterprises that contributes significantly to the country's economy (MAAIF, 2010). Important agricultural commodities include maize, beans, cassava, coffee, bananas, rice, dairy, beef and fish. Central distribution of inputs was discontinued in 1994 following the full liberalization of the inputs market. Farmers now purchase inputs from commercial inputs merchants. The responsibility for developing appropriate technology fully rests on the National Agricultural Research Organization (NARO) while the dissemination of the technologies is performed by Zonal Agricultural Development Services (ZADIS). This set-up was adopted after the decentralization of the National Agricultural Development Service (NAADs). The level of value addition varies among commodities; the dairy sector is quite advanced whereas only primary processing; limited to physical sorting and grading is done in coffee. Agro

processing in Uganda is primarily run by private firms although public-private partnership is also being encouraged and implemented. In certain cases, government participates through supply of equipment and machinery (such as milk coolers and banana processing machine). The government is primarily engaged in providing an enabling environment and incentive support to stimulate investment in the sector. Some of the support includes provision of low interest loans (10% interest against 30% for non-agricultural lending) and low tariff on imported agricultural machineries. Uganda is also promoting the commercialization of agriculture, and this effort has resulted in an increase in marketable surplus and export of high value agricultural products such as ornamentals and orchard crops.

In summary, the role of agriculture for achieving food security and poverty reduction in the IGAD region, where 70% of the poor live in the rural areas deriving livelihood primarily from subsistence agriculture, cannot be overemphasized. However, the overall performance of the agricultural sector in the region, particularly in the supply of food for the bourgeoning population has been rather disappointing. Out of the eight countries in the region, only Ethiopia and Uganda have recorded aggregate food production growth higher than population growth rates at 5.3 and 4 percent respectively (FAO, 2012). Though this is still below the CAADP recommendation (6% growth) for sustained agricultural transformation. Considering the abundant natural and human resources potentials and good climatic conditions in IGAD member countries, there exist great potentials to

attain food self sufficiency through a repositioning of the agricultural sector.

2.2 Major agricultural commodities and their relative importance

Major crops produced in the IGAD region can be categorized into food crops (mainly cereals, pulses, root tubers and oilseeds) and cash crops dominated by coffee, tea, tobacco, and cotton. Coffee and tea are produced in Ethiopia, Kenya and Uganda in the high rainfall areas. While Ethiopia produces about 57% of the region's coffee, Kenya accounts for 90% of the total tea production and Uganda leads in the production of cassava and tobacco accounting for 94% and 56% of the region's production respectively. Sudan is the region's dominant producer of sorghum and sugarcane (FAO, 2010). The main cereals produced are maize, sorghum, wheat, barley, and millet accounting for 39, 32, 12, 7 and 9 percent respectively of total production. The relative importance of these cereals varies across countries with Ethiopia dominant in maize production while Sudan accounts for nearly a third of the region's sorghum production (FAOSTAT, 2012).

In Djibouti and Somalia livestock herding is the dominant agricultural production representing about 50% and 76.9% of the total agricultural production respectively in both countries. The arable crop subsector is largely underdeveloped; in terms of variety of crops produced and the scale of production. Vegetables and fruits are produced on a very limited scale. Djibouti and

Somalia meet most of their food needs through imports, primarily from neighboring countries and from overseas or through relief support in the case of Somalia. The other five countries in the region are, by and large, crop producing economies although, the, intensity of production and types of crops cultivated varies considerably from country to country. Cereal crops are most important in Sudan, Eritrea and Ethiopia accounting for over 49% of total agricultural output while vegetables, roots and tubers production represents about 21% of total production (FAO, 2010). Similarly the share of crops in the ten top agricultural commodities is over 80% in Kenya and Uganda. However, when the within crops comparison is done, it is obvious that the contribution of grains is substantially low (12–15%). A disaggregation of agricultural production at the country level presents a clearer picture of the situation:

In Djibouti, most vegetables are produced under irrigation system. Vegetables produced include: tomatoes, onions, eggplant, melons, cucumber and cabbage. Orchard crops such as date palm, citrus and mangoes are cultivated under rain fed system. However, the local production of fruits meets less than 10% of the total demand. Wheat demand is partially met by the crop produced on land provided by Ethiopia.

In Sudan, major cereals produced and consumed locally are sorghum, millet and wheat. Sesame, cotton and groundnuts are produced as major export commodities. In periods of good harvest, when there is surplus, sorghum is also exported to neighboring countries.

In Uganda, the government is implementing the commodity approach in agricultural development, identifying and promoting the most important crops based on their relative contribution to the country's economy. The government has prioritized thirteen commodities under this strategy. The major food security crops are maize, beans, cassava, rice, bananas and horticulture crops. Coffee, tea, dairy, poultry, fisheries and cattle are produced for income generation. Maize serves dual purpose in the country; both as an emerging staple and commercial crop with about 70% of total harvest sold in the market. Cassava is produced mainly for home consumption. Important non-traditional crops produced as cash crops include cacao, flower, oil seeds, fruits and vegetables (IFPRI, 2008). There is also a recent upsurge in the cultivation of sugarcane, cotton and oil seeds.

In Kenya, maize, beans, cassava, sweet potato, wheat, rice and potato are among the major agricultural commodities cultivated. Maize is the most important staple food crop representing close to 50% of total cereal production. Over the years the status of sorghum has change from food to cash crop due to increase demand for grains in the brewery industries. Vegetables are largely cultivated under irrigation system. As with Uganda, the dairy sub-sector is fairly well developed. Substantial amount of fruits are produced in orchards such as mangoes avocados and citrus.

Food production, marketing and consumption in Ethiopia reflect the enormous diversity in agro-ecologies across the country. Most agricultural production takes place in the highlands of Ethiopia. Five major cereals—

teff, wheat, maize, sorghum, barley and Enset (*Ensete ventricosum – false banana*) are dominant in the cropping systems depending on elevation, rainfall, and market access. In rural areas, household expenditure on wheat, maize, and sorghum account for about 10 percent of total household food expenditures, with substantial regional variation (IFPRI, 2013). In contrast, Teff accounts for about 15 percent of total food expenditures in urban areas, with more than 10 percent of cereal expenditures on processed cereals (mainly flour). Livestock (cattle, sheep, and goats) are raised in most parts of the highlands as well as in the drought-prone lowlands and this account for about a fourth of agricultural GDP.

Table 4. Major commodities in IGAD member countries, 2012 (Quantity in tons)

Commodity	Djibouti	Eritrea	Ethiopia	Kenya	Somalia	Sudan	Uganda
Milk, whole fresh cow	9275	108000	3804991	3732960	480000		1207500
Milk, whole fresh camel	6800	23800		933616	1090000		
Milk, whole fresh sheep					615000		
Milk, whole fresh goat					500000		
Meat indigenous, cattle	7209	24000					
Meat indigenous, camel	12357						
Meat indigenous, goat	2438						
Meat indigenous, sheep	2226						
Sorghum		80000	3604262		184000	*4524000*	
Millet						1090000	
Maize			6158318	3600000	96000	43000	2734000
Barley		70000	1781652				
Wheat		33000	3434706			279000	
Groundnut						1767000	
Beans, dry	2500						425400
Cowpea						72000	
Tomatoes	1200						
Potatoes				2915067			800000
Cabbage and other brassicas				684000			
Roots and tubers		62000	5200000				
Cassava				893122	90000		4924560
Plantains							9200000
Sweet potato			1185050	859549			2650000
Bananas				1394412			570000
Hibiscus						30000	
Guavas						4000	
Mangoes				2781706			
Watermelon						42000	
Lemons and limes	1529						
Sesame					78000	562000	
Sunflower						86000	
Sugarcane			2700000	5822633	220000		2500000
Cotton						131000	

Source: FAOSTAT data (2012)

Chapter Three

Sorghum and sesame Value chain analysis in the IGAD region

Two major crops were selected for detailed treatment and analysis of the opportunities and challenges for value chain development in the IGAD region because of their importance in the agricultural economy of member countries. The criteria used for selecting the crops were their relative importance in household food security, export potentials and number of countries cultivating the crop. According to FAOSTAT (2011) coffee is the largest export earner with USD 1.5 billion, accounting for 37% of total revenue of the region. Sesame is the second largest export earner with USD 928 million (22.4% of total revenue). Sesame is an important export crop in five of the eight member countries, compared to coffee (Fig. 3). Also, Sesame has far greater potential for expansion in the region compared to other cash crops.

Among the food security crops, sorghum is most dominant in the region as it is the first in the local production priority list. Sorghum also accounted for 38.4% of the 4.6 Billion USD worth of grain produced in the region, surpassing maize (27.3%) and pulses (18.8%). In 2012, the production level of sorghum in Somalia, Sudan and Eritrea outstripped the production of maize (FIG.4). In addition, sorghum is agronomically better adapted to the harsh environments of the

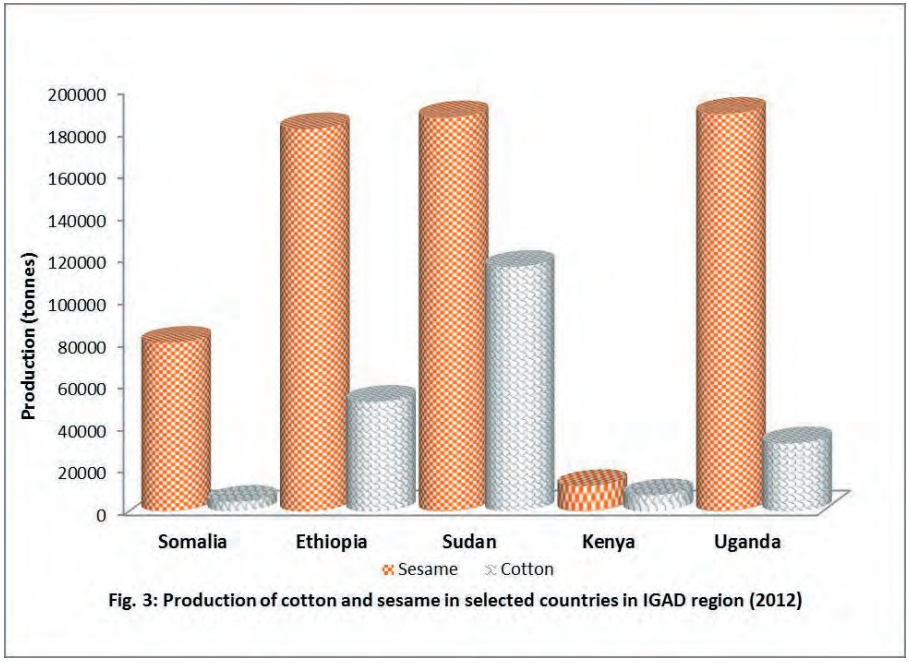

Fig. 3: Production of cotton and sesame in selected countries in IGAD region (2012)

Source: FAOSTAT data (2014)

IGAD region, and is currently the most widely produced grain crop, being a major staple crop in six countries, unlike maize, wheat and barley which seem to have restricted distribution.

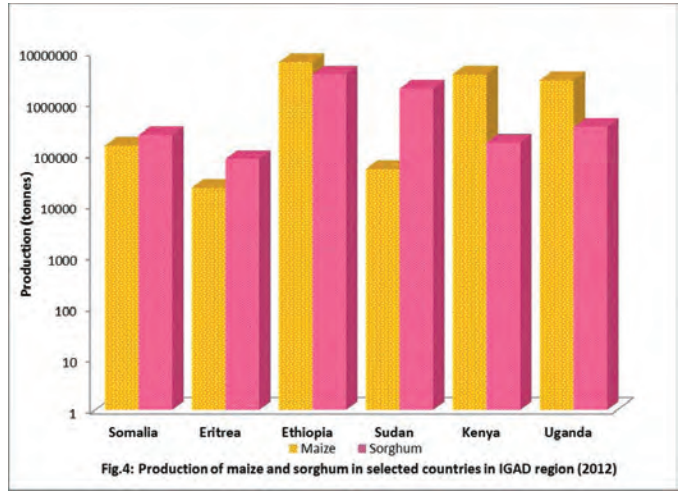

Fig.4: Production of maize and sorghum in selected countries in IGAD region (2012)

Source: FAOSTAT Data (2014)

3.1 The sorghum sub-sector

3.1.1: Production

World annual sorghum production is over 60 million tons, of which Africa produces about 20 million tons. This makes sorghum, quantitatively the second most important grain in Africa after maize (FAO 2003). Sorghum is important to food security in Africa as it is a drought resistant cereal and can withstand periods of high temperature and moisture stress. In Eastern and Central Africa (ECA), sorghum is grown on approximately 10 million ha and most of this is in the two IGAD member countries – Sudan and Ethiopia (ASARECA, 2004). Earlier sources indicated that Sudan accounted for 21.4% of Africa's sorghum production, second to Nigeria, which produced 33.8 % of the total production. Ethiopia accounted for 7.3%, Uganda 2%, and Kenya 0.6%. Sudan, Ethiopia, Nigeria and Burkina Faso account for nearly 70% of Africa's production. Recent evidence shows that Ethiopia seems to have surpassed Sudan in volume of sorghum production (Fig. 5). However, these figures do not do justice to the importance of sorghum in the continent in general and the region in particular. Often, it is the only viable food grain in arid and semi-arid agroecologies where it is predominantly cultivated. It is the most important food security crop to majority of farm households due to its adaptation to the harsh climatic conditions in most arid and semi arid regions.

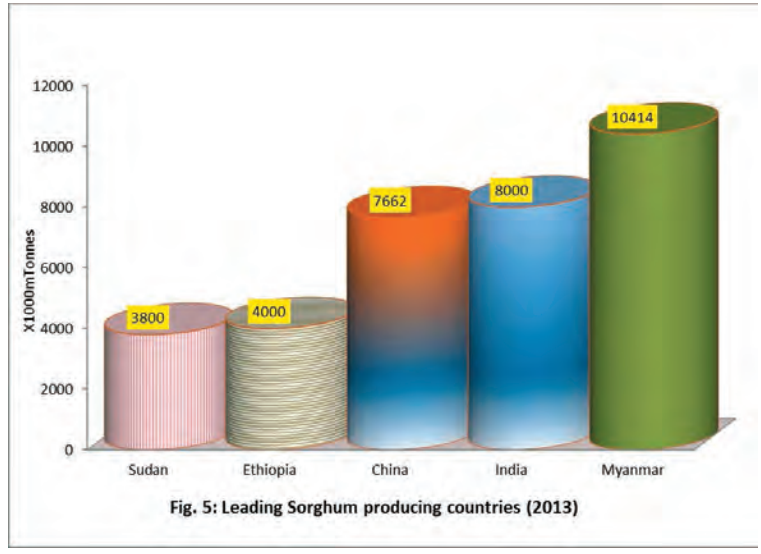

Fig. 5: Leading Sorghum producing countries (2013)

Source: Data from https://www.*worldsorghumproduction.com/*

Sorghum is the staple cereal in Eritrea, Ethiopia and Sudan. Although, the crop is produced commercially in limited areas, it is typically grown by small-scale, resource-poor farmers for home consumption. As the only cereal species indigenous to the region, sorghum is produced throughout much of the countries, even in areas with low agricultural potential. Sorghum is a resilience crop and can survive where many crops would not thrive as it requires a minimum rainfall of 250 mm per year and a minimum temperature of 10°C (Chemonics 2010). In the last two and a half decades, sorghum production has increased steadily, however, the increase in production has been as a result of increase in area cultivated and there has been no overall improvement in yield. Yield is low and on the average it is about 1ton/ha. This is because sorghum cultivation is characterized by

traditional farming practices; with low purchased inputs (little or no use of inorganic fertilizer or pesticides) and also, mostly traditional varieties are cultivated year in year out. The low yield restricts industrial utilization and commercialization potentials of sorghum. The potential for sorghum to be the driver of economic development in the region is enormous provided greater attention is given to research and development to modernize the production and marketing system.

The sorghum sub-sector is more developed in Sudan where it accounts for about 70% of total cereal production. Many farmers have access to quality seeds and the degree of commercialization is higher than the region average (Taylor, 2004). The production is supported by technical inputs provided by research institutes and Universities. Efforts are being made to strengthen the farmers-extension-research linkages. The technology and input supply and distribution system is fairly well developed in the country and it is fully liberalized. There are many private companies with agents in the districts handling seeds and input sales and direct delivery. Cooperatives are also involved in purchasing inputs from companies and distributing to member farmers. However, access to credit is limited because of the bureaucratic bottlenecks resulting in refusal or delayed release of funds. Sudan agricultural bank and farmers' commercial bank are involved in credit provision. The crop insurance subsector is largely un-patronized despite the existence of insurance company. It was observed that very few farmers utilize this window of agricultural insurance to mitigate crop losses due to lack of awareness and reported religious belief.

3.1.2 Marketing

Sorghum marketing in Sudan is relatively well structured, even though, the level of domestic production, which in turn is affected by natural and policy environments usually affect the marketable surplus. Sorghum is traded in large volumes via a well-defined marketing channel. The marketing channel of sorghum starts at farm gate level where rural traders procure the crop from rural or periodic village markets directly from farmers. Traders do the aggregation and supply to auction post in central, urban markets. In these open markets, exporters and retailers bid and purchase the crop through a public auction. Although, the process sounds simple, in reality the marketing channel is complex because of the number of intermediaries that are involved. In certain places farmers are organized into cooperatives to facilitate marketing. There are over seven hundred registered cooperatives operational across the country. A cooperative promotion office established under the Department of Extension and Technology Transfer of the MOA is in charge of facilitating cooperative formation. However, most of the aggregation and trading are performed by traders. In periods of bumper harvest, some export companies buy directly from primary/central markets and pass the sorghum through a cleaning process from impurities at localized silos to comply with international standards. A considerable amount of sorghum also goes for starch and glucose production while, some quantities are exported to neighboring countries especially in the eastern borders. A significant proportion of total sorghum production is purchased by livestock entrepreneurs for poultry and

ruminants animal fattening. Currently, the government role in grain marketing is minimal except that occasionally purchases are performed by the Strategic Reserve Corporation (SRC) to either stabilize prices and/or maintain a strategic buffer stock for emergencies, though this is at minimal level.

In the rest of the region, farmers produce enough sorghum to meet households' food requirements, with little surplus to sell (Ochieng, 2011). It is estimated that only 20-30 percent of sorghum production is actually marketed (UN, 2010). Sorghum trade is therefore generally limited due to low production volumes and small surplus, and the marketing channel is more simplified. Small producers either directly sell to consumers or local traders, except in Kenya and Uganda where farmers supply breweries through local agents of the companies. Although, Sudan, Ethiopia, Uganda and Kenya are largely considered to be self-sufficient in sorghum production, there are however, occasional imports to meet local demand. With the exception of irregular imports from the United States and European countries, the countries also import sorghum from neighboring countries. The un-recorded quantity of grains that passes through the border is reported to be more substantial than the recorded trade volumes.

3.1.3 Sorghum Value chain development: challenges and opportunities

The sorghum value chain includes several key agents, seed multipliers and suppliers, producers, middlemen

and small traders, wholesalers, grain millers, retailers, consumers and exporters as well as service providers such as seed variety developers and the National Agricultural Research System (NARs). The technology generation and dissemination system is rather similar across the region. Improved sorghum varieties are developed and supplied by the agricultural research institutions and universities, which often constitute the national agricultural research system (NARs). The extension unit is responsible for getting the technologies to the farmers. The research-extension linkage is very weak and the effectiveness of the system is greatly limited by funding.

The technology and input supply and distribution part of the value chain is equally inefficient and fraught with structural complexities which vary across countries. A host of private and public agencies and companies are involved in the business. The latter use agents placed in districts handling seed and input sales and delivery directly to farmers. Cooperatives are also involved in purchasing inputs from companies and distributing to their member farmers. About 30% of sorghum produced is sold directly to consumers i.e. breweries, institutions and individuals as is the case in Kenya and Uganda (Chemonics, 2010; Ochieng, 2011). Traders and middlemen generally bulk sorghum at local markets and transport to wholesalers (Chemonics, 2010). As a general rule, sorghum trading from production to retail is generally undertaken by individuals who work independently, rather than in organized groups. The beer industry plays key roles in the value chain of sorghum in Kenya and Uganda, and this has opened new marketing avenues for producers. In fact, many producers are

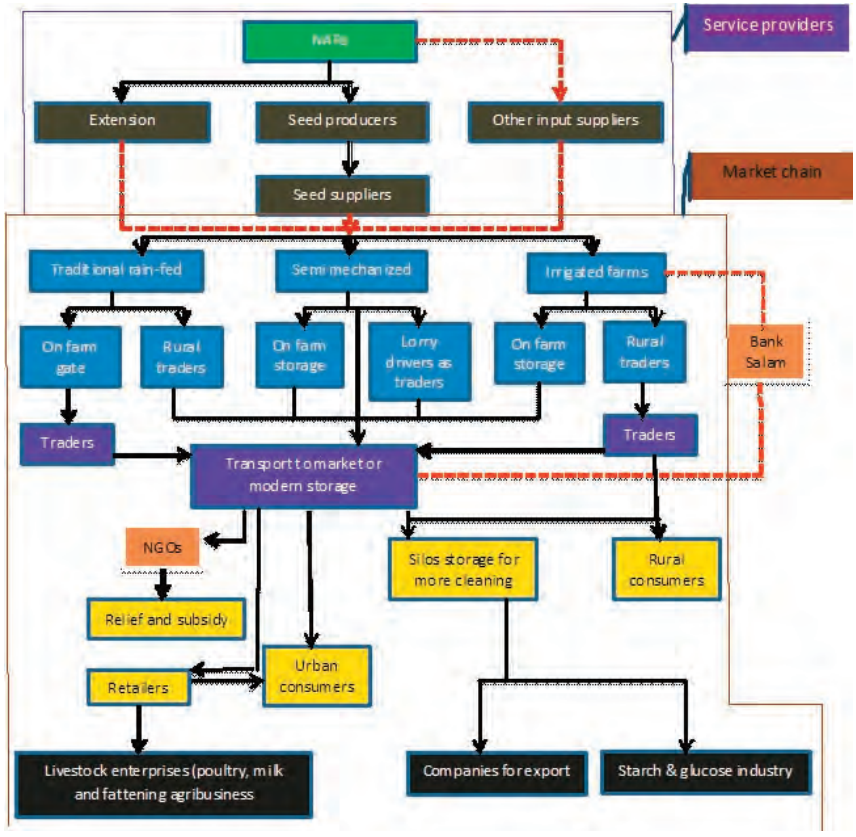

Fig. 6. *Generic diagram of the sorghum production and market chain in Sudan (Adopted from MOAI report)*

contracted to grow sorghum for the breweries directly.

The constraints to efficiency of sorghum value chain in the region are many and they vary across countries. Some of the key challenges that cut across countries are:

1) Environmental and socio-economic challenges– the crop is mostly produced in dry areas with high rainfall variability. The farmers are resource poor with subsistence oriented production methods; hardly able to afford inputs to improve productivity, hence leading to supply

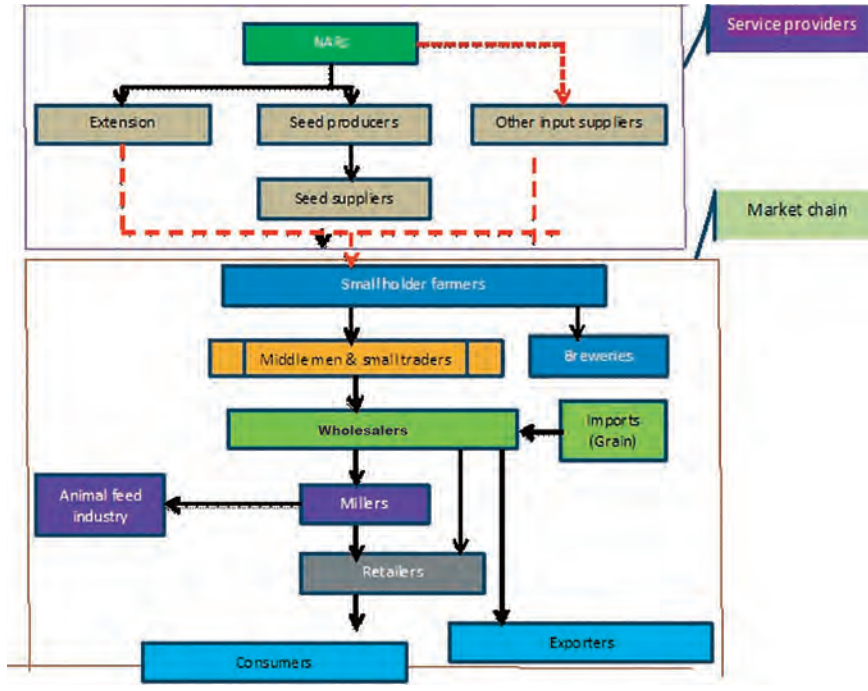

Fig. 7. *Generic diagram of the sorghum production and market chain in most IGAD member countries*

side constraints (lack of consistent supply to the market of adequate quantity).

2) Marketing challenges– the existence of large number of markets intermediaries along the chain with little or no value added to products, poor storage and lack of market information are major marketing problems.

3) Formal cross border trade is hampered by existence of tariff and non-tariff barriers, and other stringent quality standards.

4) Furthermore, lack of business skills, high cost of transportation, lack of product quality control and quality standards (grading, sorting and packaging) were found to retard chain efficiency.

Although, challenges are many however, there are certain unique opportunities that can be exploited to enhance sorghum production and marketing in the region. These include the existence of productive land, abundant water resources for irrigation, suitable seasons, and regional market – COMESA. The majority of the interviewees agreed that, though there are certain supportive policies (e.g. liberalized grain trade) in most countries but they are not implemented and unscrupulous traders take advantage of the deficiencies in the system. The study suggests that, if marketers can take advantage of the huge regional markets in the area, then most of the down-stream sector challenges can be effectively countered.

3.2 The sesame sub-sector

3.2.1 Production

Sesame is native to the tropics (IPGRI, 2004). It is produced predominantly by small scale farmers in the IGAD region. The farming methods employed in sesame production are simple and have not changed over many generations. Farmers use animal draught for land preparation, broadcasting for planting while weeding, harvesting, drying and threshing are manually performed. Sesame production is characterized by low resource use with little mechanization and use of inorganic fertilizer and chemical pesticides. Farmers have been producing sesame for subsistence and increasingly for income through the marketing of surplus production.

Africa produced an estimated 25% of the total world production and contributes nearly 40% to total exports (Dorothea, 2011). Three member countries of the IGAD region –Sudan, Ethiopia and Uganda are among the major producing countries of the world (Fig. 8). In the Sudan, the major sesame growing areas are located in the Kordofan, Sinnar, Gadarif, and Blue Nile provinces; with semi-arid climate. Rainfall period is usually between April and October, with unpredictable variability; from 470 mm to 750 mm per year. Sesame is grown entirely under rain fed conditions in traditional and the semi-mechanized systems. The vast majority of sesame fields (about 80%) are about 2ha/holdings. Sesame is grown under the traditional farming system with little or no use of machinery or modern inputs. Sudan ranks fifth, after Ethiopia, in area cultivated, and sesame yield in Sudan is lower than in the neighboring country. Its production levels are highly variable due to its reliance on rain-fed production, and consistently receive a lower price compared to products from neighboring Ethiopia. Nevertheless, sesame exports represent on average 20% of the Sudanese total agricultural exports. Leveraging sesame exports to receive a better price could translate into higher incomes for the smallholder farmers responsible for its production. According to FAOSTAT (2012), Ethiopia's sesame production is considered as fourth largest in the World- after Maynmar, India and China. According to CSA (2012) report, around 893,883 small holder farmers were engaged in sesame production in the year 2011/12 with total annual production of over 300,000 tons. Although production is dominated by small holders, commercial farms are also engaged in

sesame cultivation, creating a direct and indirect employment opportunities for around 1.5 million people (MOARD, 2003). The four major sesame growing regions in Ethiopia are Amhara, Tigray, Oromia and Benishangul-Gumuz, each respectively controlling a share of 39%, 29%, 23% and 9% respectively of the total production volume in 2011/12. Ethiopia has been significantly increasing its supply to world markets. The main importers of Ethiopian Sesame are China; which is also a major sesame exporter, Israel and Turkey. In Uganda, the crop is grown in the northern and some parts of eastern and western parts (Ashri, 2007). It is a high value crop with ready domestic, regional and international markets. Sesame is produced by smallholder farmers who grows it both for home consumption and as source of income. With the recent surge in global demand for sesame and

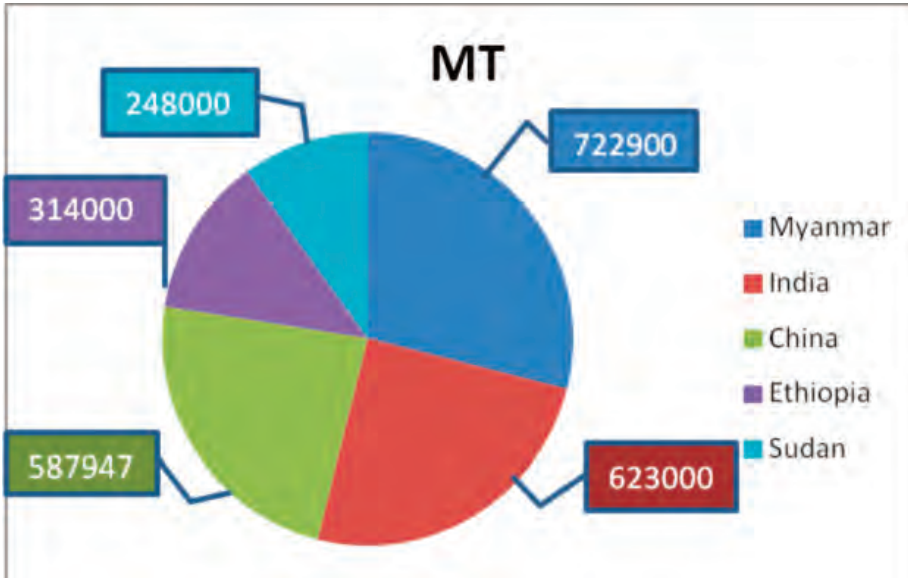

Fig. 8. The major sesame producing countries (2010)

Source: *FAOSTAT data, 2012*

sesame oil, farmers in Uganda have turned increasingly to growing sesame as a cash crop, earning it the nickname 'white gold' in Northern Uganda.

3.2.2 Marketing

Due to the fragmented and small sizes of holdings, considerable effort is required to assemble sesame into economically viable volumes for trade. Sesame marketing is therefore characterized by numerous transactions involving small volumes, and equally as many traders with variable capacities. Various actors are involved in moving sesame from the farm gate to the market. They include: traders, rural wholesalers, shop owners and stockist. During harvest season (corresponding to peak marketing season) most rural traders (assemblers) buy directly from farmers. These traders are mostly active on non-market days and then sell the accumulated stocks to wholesalers in the community grains market. The wholesalers operate mainly on designated market days as well as buying directly from farmers and other smaller traders who move sesame from farm gate to markets. The trade in sesame is therefore highly seasonal and operates for a short period after sesame is harvested when volumes are high. During the off-season, the traders move from sesame to other commodities. Other traders to be found at the assembly stage include rural wholesale and retail traders. These are stationary traders operating from permanent premises such as shops and grain stores. They buy sesame continuously throughout the sesame marketing

season from farmers directly, and traders. The bulked sesame is then transported to larger market centres, district and regional levels and sold to urban wholesale produce dealers. Once the stock of locally produced sesame is exhausted, these traders are, also, involved in sourcing for sesame from larger markets and then retail sesame seed to farmers and rural consumers at the grassroots. Regional urban wholesale traders are found at regional market centres. These are commodity traders with well established businesses and capacities to handle large volumes of sesame. These localized traders are well capitalized and have investments in storage and transport facilities. They also have adequate access to formal credit. They buy sesame mainly from rural wholesalers and sell to exporters and processors in the regional buying centres or transport bulked sesame to exporters. Exporters and processors are mostly found in the capital city. However, some exporters have buying centres in the production regions, the exporters screen, clean and bag sesame. The bagged sesame is then packed into containers which are transported to the shipping lines for onward shipment to the export destinations. Domestic processors are smaller in scale. They handle limited quantities of sesame which they process into snacks for confectionary industries and into sesame paste for distribution to retail shops and supermarkets. Other small scale processors operate in urban markets in shops that mill and blend sesame with groundnuts into sesame paste.

3.5 Sesame Value chain development: challenges and opportunities

The sesame value chain is composed of various actors including producers, traders at different administrative levels (locality, district and regional levels), transporters, small-scale and large-scale processors and exporters; and the facilitators - seed variety developers, extension etc. (Fig. 9). Other institutions that have a bearing on sesame production and marketing include: various associations involving producers, processors and exporters, Non- Governmental Organizations (NGOs) working to improve livelihoods as well as quality certification

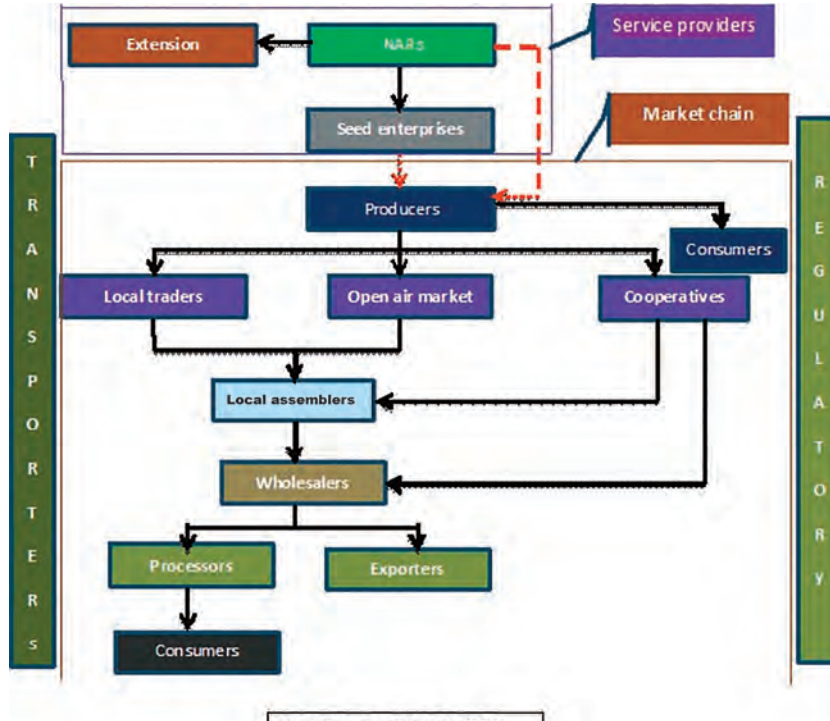

Fig. 9. Sesame value chain map

bodies. The relative role of the actors in the sesame production and marketing system is fairly consistent across the countries in the region. Sesame is still produced predominantly by small scale farmers, and the farming methods employed in sesame production are simple and have not changed over many generations.

Due to the fragmented and small-scale nature of production, considerable effort is required to assemble sesame into economically viable volumes for trade. Sesame marketing is therefore characterized by numerous transactions involving small volumes, and equally as many traders with variable capacity. Rural assemblers are involved in moving sesame from the farm gate to the market.There are urban, wholesale traders who operates in regional market centres. These are commodity traders with well established businesses and with capacity to handle large volumes of sesame. Also, there are exporters and processors who are found in the capital cities though some exporters have buying centres in the production regions.

Different farmer, processor and exporter associations exist with variable impact on the crop value chain. Farmers' cooperatives and unions are very visible in countries like Ethiopia due to their roles in helping to organize the fragmented production and marketing system of small and semi-commercial farmers through provision of greater access to inputs, market information and market outlet. The Ethiopian Commodity Exchange (ECX) has helped in mobilizing small farmers associations to benefit from direct market access. Governmental bodies especially the Ministry of Agriculture is involved

in the formulation and implementation of agricultural policy and regulations. The National Agricultural Research Systems have a more distinct role of availing a menu of appropriate technologies needed to enhance productivity. However, the research and development part on this regionally important export crop, ironically, seems to be,by and large, under-funded and under developed.

There are quite a number of critical challenges in the sesame production and marketing system in the major producing countries of the IGAD region. These include:

- The information gap among key actors. Traders often have no access to market information neither for domestic nor export markets, export quality standards and phyto-sanitary/certification. This therefore raises the importance of dissemination of information on standard and certification requirements to both traders and farmers.
- Lack of consistent quality in sesame production is largely due to the seeds that are used (narrow selection of varieties; lack of well adapted, high yielding and non-shattering varieties etc.). There are many benefits associated with procuring seeds through commercial seed companies, since recycled seed lowers yields due to reduced hybrid vigor. However, in these regions, farmers tend to get their seeds through informal networks. In fact, the majority of smallholder farmers use saved seeds grains from previous planting.
- Except for regional wholesalers, the majority of traders resell soon after buying. This is because grass-

roots traders do not have storage facilities. Lack of storage facilities was found to be a major problem in Uganda and out of the 400,000 to 600000 MT surpluses there is only enough space for 100,000 MT. Moreover, sesame is a high value commodity, and traders may lack sufficient capital to accumulate sesame and therefore need a quick turnover in order to return to the market and buy again. Farmers also sell their seeds quickly after harvest to pay off debts and laborers, as well as to cover the costs of planting and harvesting the next sorghum and millet crops. The harvest period usually coincide with period of glut in the sesame market and the associated fall in price. Most of the harvested grains are sold in the village markets with little or no value added.

- The numerous categories of traders involved in sesame marketing especially at the grass root level is another source of inefficiency and only a small portion of the harvested sesame goes directly to wholesale traders who offer better prices. This reflects the problem of low and uneconomical volumes.
- Rural Assemblers account for nearly 50% of the aggregate volume in most of the countries where sesame is an important commodity. Because these are seasonal and non-permanent traders the bulk of sesame is sold through spot transactions which are not governed by contracts or institutions. Consequently, it is difficult to enforce quality standards or contracts between the actors, which limits access to markets that have stringent quality requirements. Farmers may also engage in opportunistic behavior such as adulteration of sesame

with sand or soil since there are no feedback channels between traders and farmers or traceability.

- The fluctuation in rainfall both in terms of quantity and distribution is characteristic of the main growing areas, therefore output is heavily impacted by this environmental factor as sesame is primarily cultivated under rain-fed conditions.

There are great opportunities for developing the sesame value chain in the IGAD region. The existing production and marketing conditions that favour production includes:

- The growing demand for sesame in both domestic and export markets
- Availability of credit facilities for traders in some of the countries
- The fact that trade in sesame is reported to be profitable as handling and shipping costs are relatively low
- On-going considerable infrastructure development efforts in the countries thus lowering operating and transportation costs for sesame
- Some countries such as Ethiopia and Kenya implementing new and effective institutional arrangements i.e. Ethiopian Commodity Exchange, which present opportunities for information sharing, organized aggregation and sale of sesame.
- Sesame production is already part of the cropping system in the area.

Chapter Four

Efforts in commodity value chain development in IGAD region

Member countries in IGAD region have taken steps to enhance the production and marketing of agricultural commodities and to improve the efficiency of product movement along the value chain. Examples of notable programs and policy interventions embarked upon by member countries include:

- The tax exemption policy for agricultural investors in Sudan. The aim of the incentive is also, to encourage the export of high value agricultural products. The policy environment to facilitate this include the use of tax rebate instrument, purchase of production inputs at reduced prices, flexibility for collecting export earnings, access to credit facilities at reduce interest rates, tax holidays etc.

- In Uganda, the government has come up with a special incentive package to stimulate trade including provision of low interest loans, allowing the importation of machinery at very low taxes, zero tax on export of agricultural commodities and import of materials for producing export commodities, facilitate marketing through favorable tariffs and capacity building. Commercialization challenge fund has also been established to enable farmers to transit to agro-processing. The fund is managed by the banks and can be used for machinery pur-

chase and the development of irrigation systems. The use of crop weather index system has also been initiated.

- The Kenyan government has introduced measures to enhance public-private participation in agricultural investments; especially in agro-processing and value addition activities. The program on investments returns is one of such initiative; it is directed at refunding investors who invest a minimum of 200 million shillings through installment. Also, a one-stop shop service is provided to prospective investors; investors can benefit by establishing agribusinesses in a fully facilitated and developed economic zones, especially those who would export 80% and more of their output. However, Kenya is similarly experiencing some of the commonly shared challenges including tax related and regulatory obligations. The cost of establishment of an agricultural business and running the operation is comparably high. Agro-processing activity is constrained by un-reliable quantity and quality supply of raw agricultural produce. To counter the problem of lack of reliable and up to date market information on input and output price situations, the government provides market information service to subscribers through emails, dedicated online information and through the media.

At the regional level, increasing global demand for food grains is a necessary impetus that can be leverage to increase production and value chain development. This coupled with the improving security situation in IGAD member countries should present an excellent opportunity for improving the global trade share of the region. The growing niche markets for organic crop also create

opportunities for farmers to benefit from premium prices for produce that are cultivated organically. One of the very significant developments that is potentially going to benefit and increase the competitiveness of the region is the development corridors being linked through road and other infrastructural networks. Three corridors i.e. Djibouti-Addis-South-Sudan, Berbera – Addis and Mombasa-Moyale-Addis are almost operational. Three more are being planned: Port Sudan-Gadarif - Addis, Sudan - South Sudan - Kampala - Juba-Addis-Djibouti (IGAD secretariat). These corridors will help strengthen trade relations and regional economic integration. Intensive efforts are also underway to harness the power of telecommunications.

IGAD secretariat is working to involve the private sector through the IGAD business forum comprising national chambers of commerce of member states except Somalia and Eritrea. The ultimate aim of this forum is to develop and further enhance the involvement of the private sector in agricultural production and marketing. The implementation of the IGAD Drought Disaster Resilience Sustainability Initiative (IDDRSI) and the execution of the associated regional and country programs will go a long way towards helping consolidate the current collective consensus and sense of urgency among the governments; and to enhancing future regional economic and political integration. COMESA on its part has introduced comprehensive trade facilitation programs, which not only seek to remove tariff and non-tariff barriers but also take steps to simplify trade and lower the cost of doing business. By doing so, COMESA aims to promote

competitiveness in regional and global markets. However, it is difficult to verify the level of performance of the REC countries in the removal of these barriers because they cover a wide range of trade-retarding policies and activities, most of which are not directly measurable.

Chapter Five

Summary and conclusions, policy implications and recommendations

5.1 Summary and Conclusion

The IGAD region comprises eight countries, covering a very wide geographical area of about 5.2million km^2 and a fast growing population of 215.6 million people. This constitutes a great opportunity for development through economic integration. The IGAD region has vast amounts of uncultivated arable land and the area is well suited for cereal production. This shows the huge potential for agricultural led development initiative in the region which can be greatly enhanced by intra and inter country trade and investment in agricultural commodity chain.

The agro-ecology of the region is primarily arid and semi-arid where pastoral systems are dominant. But in terms of employment, food supply and revenue generation, agriculture remains the growth engine for attaining much of the millennium development goals in the region. Half of employment growth between 1999 and 2009 in the IGAD region is due to growth in agriculture (FAO, 2012). Given the important role of agriculture in IGAD member countries' economies, and its position as the largest employer of labour, it should be central to the structural transformation and economic revival efforts in the region.

Given that the larger population in the IGAD region is rural and lives largely on agriculture, the extent and path of agricultural development has enormous economic and social implications. When agriculture develops increased demand for upstream products such as fertilizers, seeds, pesticides and machinery occur. Downstream activities would also grow, e.g. grain milling and other types of food processing. Indeed, demand grows fast, not only for raw produce but also for high-value food products. Factoring in higher upstream demand and downstream activities, the increase in agricultural output could translate into additional billion Dollars in revenues for the countries.

As evidenced by the crop case studies in the member's states, there is huge opportunity for improvement. Key challenges in crop value chains development includes: the poor state of support and research infrastructure occasioned by poor funding, absence of productivity enhancing technologies, a weak extension support system, sub-optimal use of production inputs, poor and inefficient distribution system (high transport and storage cost), under-developed post-harvest and marketing activities. It was also observed that most of the country level interventions in commodity development was biased towards increasing farm production only, at the expense of upstream post harvest and marketing activities development This has resulted in the continued dependence on export of raw agricultural products with a low and, highly variable market price It has also resulted in substantial revenue loss due to the inability to access high value markets.

5.2 Recommendations

Based on the findings of this study, the following recommendations are proffered to fast track the development of agricultural commodity value chain in IGAD member states.

1. A re-alignment of present development efforts, at the country level, to strengthen upstream agri-business developments through the provision of the needed policy and infrastructural support.
2. Adopting targeted policy interventions to benefit smallholders especially through access to soft loans that will enable them to adopt productivity enhancing technologies, considering their resources limitations.
3. The reactivation and strengthening of production, processing and marketing cooperatives to enhance the economic competitiveness of key actors along the chain.
4. Formulation and Implementation of policies to encourage public-private partnership along the value chain especially in rural financing and market information supply.
5. Bold steps need to be taken in the policy arena to remove barriers (trade and non trade) to free movement of agricultural labour and commodities across national boundaries so as to take advantages of resources complementarities in the region.
6. Strengthening the weak political will of Member States to fully implement resolutions needed to

harmonized macro-economic framework to promote cross-border trade and investments activities that are of relevance in encouraging regional cooperation and integration. The member states have to show strong commitment to implement the decisions of the 12th Ordinary Summit of the Inter-Governmental Authority on Development (IGAD) on minimum integration plan (MIP), which is perceived as a mechanism for the convergence of the Regional Economic Communities to strengthen cooperation and benefit from one another's comparative advantages, best practices and experiences in the areas of integration (IGAD, 2012).

7. The economic power of individual countries in the IGAD region is small but if the countries can build ties, collectively they can realize fast growth and turn their natural endowments into an asset and huge economic benefit. The ground work is being laid in establishing trade and economic corridors linking the trade centers. There is the need to go beyond the establishment of free trade zones between countries to the standardization of investment codes and allowing exchange of labor, research outputs and capital.

8. IGAD secretariat should put together a high level technical advisory group on strategic agricultural commodity value chains development. Such a group would come up with a blue print for the formulation and implementation of integrated value chain approaches considered key for ensuring food security and enhancing regional trade.

9. There is the need to initiate in depth value chain studies on other agricultural commodities considered strategic for economic integration in the region. Such study should adopt a more thorough, on the field, assessment of actors and processes, costs and tradeoffs to identify players whose action limits the efficiency of the commodity chain.

Recommendations from the study validation workshop

In addition to the recommendations above, other key recommendations from the validation workshop includes:

1. The National Agricultural and Food Security Investments Plans (NAFSIPs), under CAADP, should be implemented so as to encourage private sector investments along the commodity value chain.
2. The mainstreaming of gender and youths in commodity value chain development, considering the critical roles they play in the region's agricultural development. Further studies on commodity value chain should adopt and emphasize use of gender and youths disaggregated analyses.
3. The need to strengthen the linkages between policy makers, research institutions, agribusinesses, producers, extension providers and marketers at the national level so as to improve the efficiency and reliability of the chain.

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Annexes

Annex 1

Checklist of guiding questions used during the discussions and interviews

Section A: General Information

1. How important is agriculture in the national economy?

   1.1. How has it been evolving in the last decade

2. Organizations, institutions and policies?

   2.1. What policies and strategies are in effect to develop agriculture?

3. Who are the major players – small scale? Private commercial? What is the role of women, youth, and men in agricultural production?

4. What are the top most important agricultural commodities?

5. What is the contribution of crops in the agricultural economy?

6. The five most important crops? Their relative importance?

7. How much of these crops is consumed? How much is marketed?

   7.1 How well structured is the market?

   7.2. What is the role of cooperatives?

   7.3 What are the market challenges?

8. What are the competitive/comparative advantages the country has on crops?

9. What are the threats and opportunities for agricultural investment?

   9.1 Food sector

   9.2 Industrial sector

Section B: High priority crop value chains

1. Technology generation & dissemination

- How is technology generated? What is the role of the public & the private sector?
- How effective is the system? What are the challenges?
- How effectively linked are research and extension?

2. Production

- How is the production system organized?
  - What is the average land holding? Proportion of small, medium & large scale producers?
- How does the farming community access inputs? What do the supply and distribution systems look like?
- How are improved technologies accessed?
- What kind of support services does the farmer get?
  - Input credit?
  - Crop insurance?

3. Post-harvest

- How are crops harvested, processed and stored? What is the level of improved technology use?
- What kind of support services are provided?
- Major challenges?

4. Market and demand sinks

- How are crops marketed? How much as grain? How much as processed product?

- How well is the market structure developed for crops? Who are the major actors? How effective are the linkages?
  - ❍ Any recent efforts to improve marketing?
  - ❍ Availability of large institutional buyers? Food processing? Others?
  - ❍ How big is the domestic market? Prospects for export?
- What kind of support services are provided?
  - ❍ Output financing?
  - ❍ Aggregation?
  - ❍ Logistics?
- What is the level of value creation in crop commodities
  - ❍ The level of private sector involvement in agro-processing?

5. *What are the policy and institutional provisions to strengthen the private sector involvement*

Annex 2

List of contacted persons

No.	Name	Position	Affiliation
1.	Elamien Hassan Elamien	Director General, International Cooperation Directorate	Ministry of Agriculture & Irrigation, Sudan
2.	Babiker Hag Hassan Ibrahim	Director General, Planning & Agricultural Economics	Ministry of Agriculture & Irrigation (MOAI), Sudan
3.	Suad Abdalla Ali Rammram	Director, Gender Mainstreaming and Development	MOAI, Sudan
4.	Azhari Mahjub Farah	Director, Agricultural Statistics	MOAI, Sudan
5.	Bakhita Mahgoub Elshafie	Director, Agricultural Marketing	MOAI, Sudan
6.	Sumaya Ahmed Hamid	Director, Extension and Technology Transfer	MOAI, Sudan
7.	Hashim Hassan	Director, Seed Administration	MOAI, Sudan
8.	Hatim Ibrahim	Director, Agricultural Mechanization	MOAI, Sudan
9.	Mubarek Elmontosim	President	Seed Producers Association, Sudan
10	Abdalla Ibrahim	Trader	Private Sector
11.	Abutalib	Director, Agricultural Exports	Ministry of Trade and Commerce
12.	Awatif Mohamed Awad Alkarim	Deputy Head,	COMESA, Sudan
13.	Dr. Rashid	Head of Crop Department	Ministry of Agriculture, Djibouti
14.	Syad Ali Hasan	Research Officer	Chamber of Commerce, Djibouti

15.	Ahmed Kedir	Chairman	Fruit and Vegetable Importers, Djibouti
16.	Oumar Hassen	Former Chairman	Fruit and Vegetable Importers, Djibouti
17.	Fahti Said	Secretary General	Fruit and Vegetable Importers, Djibouti
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19.	Mohamed Moussa Mohamed	Director, Agriculture & Environment	IGAD
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28.	Emanuel	Director	FAO, Djibouti
29.	Ssekimwanyi Kyagaba	Principal Statistician	Ministry of Agriculture, Animal Industry & Fisheries (MAAIF), Uganda
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31.	Tom Kakuba	Program Officer, Monitoring and Evaluation	MAAIF, Uganda
32.	Samuel Ssemanda	Commissioner, Planning	MAAIF, Uganda
33.	Dans Muhneri	Assistant Commissioner, Agri-Business	MAAIF, Uganda
34.	Alex Lwakuba	Assistant Commissioner, Crop Production	MAAIF, Uganda

35.	Beatrice Namaloba	Senior Agricultural Officer, Crop production	MAAIF, Uganda
36.	Deborah Kyarasiime	Project Officer	Ministry of Trade, Industry and Cooperatives, Uganda
37.	Lwere John Bosco	Trade Promotion Officer	Uganda Export Promotion Board
38.	Mathias Okuri	Program Officer	Grain Council of Uganda
39.	Musisi Henry	Managing Director, V/Chair of Uganda Grain Council	Agtrade (U) Ltd, Uganda
40.	Anna Mutinda	Principal Agricultural Officer, Department of Agribusiness and Marketing	MOA, Kenya
41.	*James Odour*	*CEO*	*National Drought Management Authority, Kenya*
42.	*Lawrence Ragwa*	*Assistant Director*	*Kenya Agricultural Research Institute*
43.	*Abdusemed Abdo*	*Director, Crops*	*Ministry of Agriculture (MOA), Ethiopia*
44.	*Dr. Asnake Fikre*	*Director, Crops Research*	*Ethiopian Institute of Agricultural research, Ethiopia*
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Challenges and Opportunities for Strategic Agricultural Commodity Value Chains Development in the IGAD Region

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